

current supply and counted through a jack and plug (not shown) and the device is artificially reciprocated by any convenient means through a known or counted number of cycles.

It is thus seen that the mechanically actuated magnetocrystalline counter may be used for counting a series of cyclic mechanical events whether they are of a reciprocating or rotating nature.

I claim:

1. A mechanically actuated magnetocrystalline counter for counting a series of mechanical events, said counter comprising:

- a. a uniaxially anisotropic magnetocrystalline platelet having means associated therewith for sustaining at least one movable cylindrical magnetic domain therein and means for guiding said domain to move sequentially through a predetermined shift register pattern of positions therein;
- b. permanent magnet means mounted to be moved relatively to said platelet responsively to a mechanical event comprising a pair of apertured magnets mounted adjacent to each other in opposed polarity relationship with the apertures thereof aligned to form a central chamber in which said uniaxially anisotropic magnetocrystalline platelet is spring mounted for movement in and orthogonally to the central field of said apertured magnets responsively to a mechanical transient applied thereto by one of said mechanical events to be counted for generating a cyclically moving magnetic field for moving said at least one movable magnetic domain through said serial shift register formed in said platelet to form a bit stream which digitally accumulates data representative of said series of mechanical events, each cycle of said field motion resulting from one of said mechanical events and each said cycle of said field motion producing a single bit in said bit stream; and,
- c. means to read out the count thereby accumulated in said shift register.

2. A mechanically actuated magnetocrystalline counter for counting a series of mechanical events as in claim 1 wherein said means to read out the count accumulated in said shift register comprises a transparent means for covering said uniaxially anisotropic magnetocrystalline platelet and for providing a site for observation of the position of magnetic domains therein by optical means.

3. A mechanically actuated magnetocrystalline counter for remote reading of a plural register mechanically driven meter, said counter comprising:

- a. a uniaxially anisotropic magnetocrystalline platelet having means associated therewith for sustaining a plurality of movable cylindrical magnetic domains therein and means for guiding said domains to move sequentially through a predetermined shift register pattern of positions therein;
- b. permanent magnet means mounted to be rotated by the shaft of the least significant digit register of said meter for generating a cyclically moving magnetic field for moving said movable magnetic domains through said serial shift register formed in said platelet to form a bit stream which digitally accumulates data representative of the rotation of said shaft, each cycle of said field motion resulting from one complete 360° rotation of said shaft and each cycle of said motion generating one new domain and indexing all other domains forward one

position to produce a single bit in said bit stream, the total bit storage capacity of said platelet being at least equal to the total count capacity of said meter divided by the numerical value of the number base of the registers of said meter; and,

c. means to read out the count accumulated in said shift register by said bit stream.

4. A mechanically actuated magnetocrystalline counter for counting a series of mechanical events as in claim 2 wherein said permanent magnet means mounted to be moved relatively to said platelet responsively to a mechanical event to be counted comprises at least one permanent magnet mounted on a rotor which in turn is connected to be rotatably driven by a shaft of a mechanical meter, one rotation of said shaft representing a count equal to one event and said rotor being centrally apertured to provide a space for receiving said magnetocrystalline platelet within said aperture, said rotor mounted permanent magnet producing a field which rotates in the major plane of said platelet.

5. A device as in claim 4 wherein

- a. said meter is a utility flow meter; and wherein,
- b. said shaft rotatably driving said rotor is the shaft of the lowest significant digit dial of said meter; and,
- wherein,
- c. one rotation of said shaft represents a count equal to the number base of the number system in which said meter is calibrated.

6. A mechanically actuated magnetocrystalline counter for counting a series of mechanical events as in claim 2 wherein said means to read out the count accumulated in said shift register comprises:

- a. means to supply current to a normally passive magnetoresistive sensor positioned in the path of flow of said bit stream representing magnetic domain of said serial shift register formed in said platelet;
- b. means to generate a rotating magnetic field for moving said at least one movable magnetic domain of said shift register past said sensing resistor to produce a change in resistance of said magnetoresistor which results in a voltage pulse across said resistor; and,
- c. means utilizing said voltage pulse to determine the position which said movable magnetic domain had reached in said shift register and thereby to read the accumulated count therein.

7. A device as in claim 6 wherein said series of mechanical events to be counted comprises the rotation of the pointer shaft protruding through the dial face of the least significant digit meter of a utility flow meter;

wherein said permanent magnet means mounted to be moved relatively to said platelet responsively to said mechanical event to be counted comprises at least one permanent magnet mounted on a rotor which in turn is connected to be rotatably driven by said shaft; and,

wherein one rotation of said shaft represents a count numerically equal in the units which the meter measures to the number base of the number system of the meter, said shift register accumulating one bit for each of said rotations and said shift register having a total capacity equal to the total reading capacity of said meter divided by said number base thereof.

8. A device as in claim 2 wherein said means to read out the count accumulated in said shift register comprises: